that said nanoparticles form a monolayer on said substrate...." citing column 1, lines 20-31. However, independent claim 42 recites that the "nanoparticles are electrically insulating with a dielectric constant greater than 10". Alivisatos' nanocrystals are comprised of transition metal oxides, column 2, lines 32-34. Alivisatos' nanocrystals are different from those claimed in independent claim 42 in two specific ways:

1. Transition metal oxide nanocrystals are not electrically insulating as claimed independent claim 42, and
2. Transition metal oxide nanocrystals do not have a relative dielectric constant greater than 10 as claimed in independent claim 42.

The Examiner contends that although Alivisatos does not mention using their nanocrystals in a field effect transistor, it is obvious to combine Alivisatos with Tressler, because Tressler describes fabrication of a field effect transistor, citing Tressler at column 11, lines 22-28. The column 11 citation describes the positions of the source/drain contacts in a polymer field effect transistor.

This contention of obviousness is strongly traversed. Tressler describes making field effect transistors out of polymer materials. Of all the different parts of the transistor – metallic source/drain contacts, semiconducting channel materials, conducting gate contact, and insulating gate material – Tressler does not mention using nanocrystals in any part. As stated above, Alivisatos describes a method for synthesizing transition metal oxide nanocrystals, which are not insulating materials. Furthermore, Alivisatos does not describe the use of transition metal oxide nanocrystals in any way in a field effect transistor device.

In contrast, independent claim 42 claims a field effect transistor comprising a layer of electrically insulating nanoparticles (not the type described by Alivisatos) as the gate material in a field effect transistor. Neither Alivisatos nor Tressler in any way implies the use nanoparticles in this way. In fact, Alivisatos' nanocrystals are not suitable for use in the gate of a field effect

transistor because they are not electrically insulating. Therefore, the combination of Alivisatos and Tressler does not meet the recitation "nanoparticles are electrically insulating with a dielectric constant greater than 10" as claimed in independent claim 42.

With regard to dependent claim 44, the Examiner states that Alivisatos teaches that "...said nanoparticles are formed via non-aqueous chemical process that injects metal oxide precursors at temperatures in a range between about 600C to about 300C", citing column 3, lines 39-52. In this passage, Alivisatos describes a procedure to synthesize iron oxide nanocrystals (line 39) – not the insulating, high-dielectric-constant nanoparticles claimed in dependent claim 44 and independent claim 42. Again, independent claim 42 and dependent claim 44 recite electrically-insulating nanoparticles, and even further that these insulating nanoparticles have dielectric constant higher than 10. While Alivisatos mentions heating a solution to 300C, Alivisatos does not mention the temperature range claimed in claim 44.

With regard to claim 45, the Examiner states that Alivisatos teaches that "...said nanoparticles are formed in a predetermined crystalline phase by either synthesizing or heating", citing column 4, lines 38-43. In this passage, Alivisatos discusses a method by which one forms a monolayer of metal-oxide nanocrystals. There is no mention of heating the nanocrystals for forming a proper crystalline phase.

With regard to claim 46, the Examiner states that Tressler teaches the method of increasing the thickness of deposited nanoparticles films by repeated application and heating steps, citing column 8, lines 28-38. In this passage Tressler describes a method for depositing the source and drain contacts onto the semiconducting polymer material. Tressler describes using evaporation of gold to deposit these contacts. It is not understood how this has any bearing on

claim 46 that recites repeating the depositing and heating steps to increase the thickness of the thin film.

The Office Action provides no motivation for one skilled in the art to combine Alivisatos and Tressler. The Examiner contends that "nanoparticles/nanocrystals are an art recognized substitute for polymer material, as described in column 11, lines 29-36 of Tressler". This citation reads as follows:

> "The use of polymer conjugated materials (such as P3HT) rather than oligomer/small molecule materials also provides some process advantages. Polymer materials can generally be deposited at room temperature, making processing easier and cheaper and affording compatibility with a wider range of substrate materials (e.g. plastics instead of glass for a display device). Polymers are also generally more robust and less prone to damage during post-processing steps."

This citation discusses the advantages of polymer materials for building transistor devices, but does not discuss nanoparticles/nanocrystals in any way and certainly do not imply, as the Examiner states, that nanoparticle/nanocrystals are "a recognized substitute for polymer materials."

The Office Action suggestion to use Alivisatos in combination with Tressler is improperly based on the hindsight of Applicants' disclosure. Such hindsight reconstruction of the art cannot be the basis of a rejection under 35 U.S.C. 103. The prior art itself must suggest that modification or provide the reason or motivation for making such modification. In re Laskowski, 871 F.2d 115, 117, 10 USPQ 2d 1397, 1398-1399 (CAFC, 1989). "The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made." Sensonics Inc. v. Aerosonic Corp. 38 USPQ 2d 1551, 1554 (CAFC, 1996), citing

Interconnect Planning Corp. v. Feil, 774 F. 2d 1132, 1138, 227 USPQ 543, 547 (CAFC, 1985).

For the reason set forth above, it is submitted that the rejection of claims 42-46 under 35 U.S.C. 103(a) is erroneous and should be withdrawn.

The Office Action cites a number of patents that were not applied in the rejections of the claims. These patents have been reviewed, but are believed to be inapplicable to the claims.

It is respectfully requested for the reasons set forth above that the rejection 35 U.S.C. 103(a) be withdrawn, that claims 42-46 be allowed and that this application be passed to issue.

Respectfully Submitted,

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